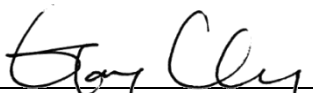
# Antenna Pattern Report

| | | |
|---|---|---|
| **Equipment** | : | **FWS217 Antenna** |
| **Model No.** | : | **PCBA Antenna** |
| **Brand Name** | : | **GOODZ2** |
| **Applicant** | : | **CviLux Corporation** |
| **Address** | : | **9F., No.9, Lane 3, Sec 1, Chung-Cheng East Road, Tamshui, New Taipei City, 25147, Taiwan** |
| **Received Date** | : | **Apr. 16, 2015** |
| **Tested Date** | : | **Dec. 23, 2015** |

**We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.**

**Approved & Reviewed by:**



**Gary Chang / Manager**

# Table of Contents

# Release Record

| Report No. | Version | Description | Issued Date |
|---|---|---|---|
| AP541603 | Rev. 01 | Initial issue | Apr. 01, 2016 |

# 1 General Description

## 1.1 Information

| Brand | Model | Product name | Type / Connector |
|---|---|---|---|
| GOODZ2 | PCBA Antenna | FWS217 Antenna | Printed / NA |

## 1.2 The Equipment List

| Test Item | Radiated Emissions | | | | |
|---|---|---|---|---|---|
| Test Site | Fully-anechoic chamber 1 / (05CH01-WS) | | | | |
| **Instrument** | **Manufacturer** | **Model No.** | **Serial No.** | **Calibration Date** | **Calibration Until** |
| Spectrum Analyzer | Agilent | N9010A | MY54200247 | Aug. 24, 2015 | Aug. 23, 2016 |
| Bilog Antenna | SCHWARZBECK | VULB9168 | VULB9168-524 | Oct. 03, 2015 | Oct. 02, 2016 |
| Horn Antenna 1G-18G | SCHWARZBECK | BBHA 9120 D | BBHA 9120 D 1094 | Oct. 20, 2015 | Oct. 19, 2016 |
| Horn Antenna 18G-40G | SCHWARZBECK | BBHA 9170 | BBHA 9170508 | Jan. 05, 2015 | Jan. 04, 2016 |
| Preamplifier | Agilent | 83017A | MY39501310 | Dec. 11, 2015 | Dec. 10, 2016 |
| Preamplifier | EMC | EMC02325 | 980146 | Oct. 14, 2015 | Oct. 13, 2016 |
| Preamplifier | EMC | EMC184045B | 980192 | Sep. 01, 2015 | Aug. 31, 2016 |
| RF Cable | HUBER+SUHNER | SUCOFLEX104 | MY16609/4 | Dec. 04, 2015 | Dec. 03, 2016 |
| RF Cable | HUBER+SUHNER | SUCOFLEX104 | MY16608/4 | Dec. 04, 2015 | Dec. 03, 2016 |
| RF Cable | HUBER+SUHNER | SUCOFLEX104 | MY16617/4 | Dec. 04, 2015 | Dec. 03, 2016 |
| LF cable 3M | Woken | CFD400NL-LW | CFD400NL-005 | Dec. 04, 2015 | Dec. 03, 2016 |
| LF cable 10M | Woken | CFD400NL-LW | CFD400NL-006 | Dec. 04, 2015 | Dec. 03, 2016 |
| Measurement Software | AUDIX | e3 | 6.120210g | NA | NA |
| Note: Calibration Interval of instruments listed above is one year. | | | | | |

## 1.3 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2).

| Measurement Uncertainty | |
|---|---|
| **Parameters** | **Uncertainty** |
| Antenna gain | ±2.787 dB |

# 2 Test Configuration

## 2.1 Testing Condition and Location Information

| Test Item | Test Site | Ambient Condition | Tested By |
|---|---|---|---|
| Antenna Pattern | 05CH01-WS | 24.2°C / 66% | Chris Zeng |

## 2.2 Test Modes and Frequency Details

| Test item | Test Frequency (GHz) |
|---|---|
| Antenna Pattern | 2.4 / 2.45 / 2.5 |

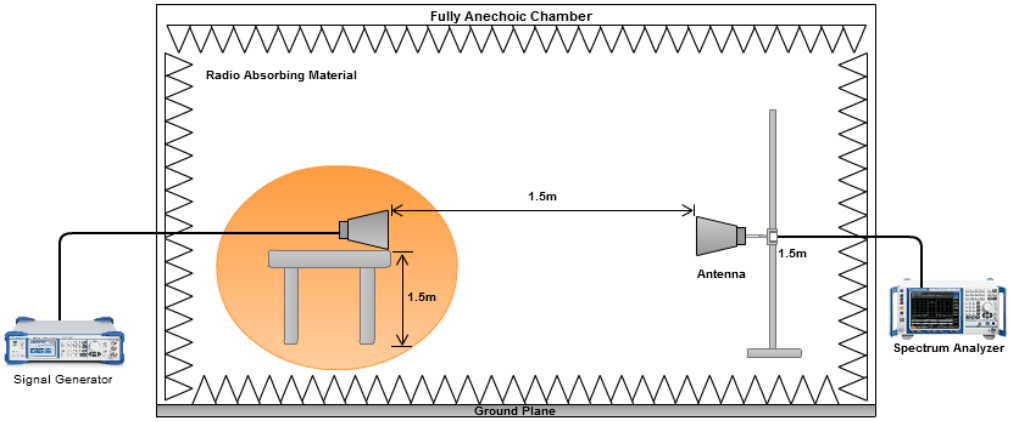
# 3 Test Results

## 3.1 Test Procedures

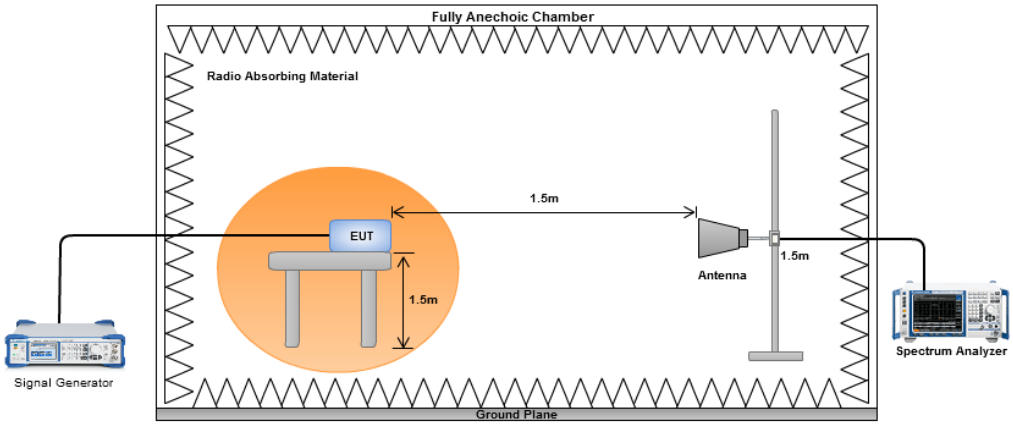
1. Use a calibrated antenna to get reference value.Put the calibrated antenna on the test table and connected to signal generator via a RF cable. Signal generator outputs CW signal to calibrated antenna and power level of CW signal is 0 dBm. Test table is turned around 360 degree and test tool records the max value of spectrum analyzer. This value is the reference value R1.
2. Remove calibrated antenna and put EUT at the same position. Follow condition of step 1, test tool records max value ( R2) of spectrum analyzer
3. Antenna gain of EUT can be compared and calculated by below formula
   Gain = R2 - R1 + Antenna gain of calibrated antenna

## 3.2 Test Setup

Test setup for Calibrated antenna




Test setup for EUT

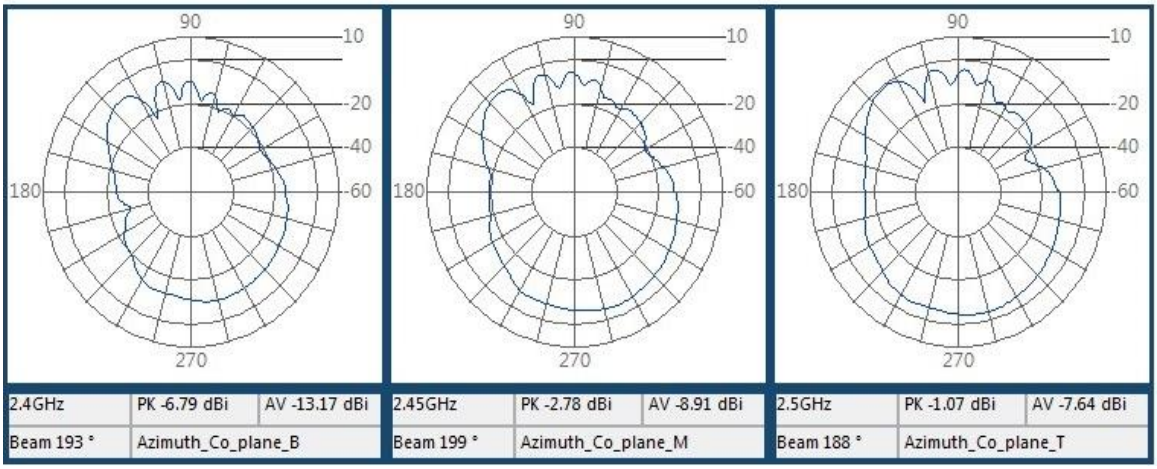


## 3.3 Test Results

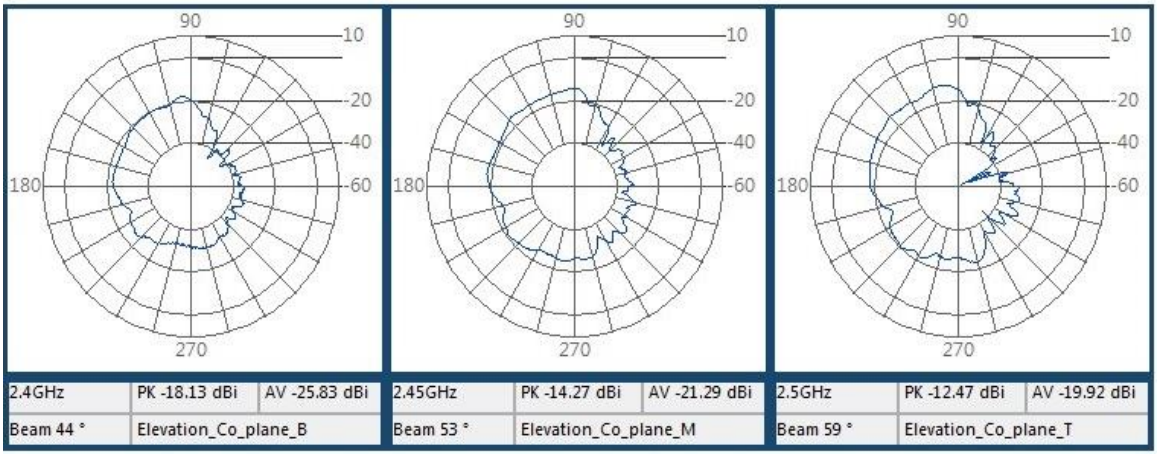
| Polarization | Frequency (GHz) | Gain (dBi) | HPBA (Degree) |
|---|---|---|---|
| Horizontal | 2.4 | -6.79 | 193 |
| | 2.45 | -2.78 | 199 |
| | 2.5 | -1.07 | 188 |
| Vertical | 2.4 | -18.13 | 44 |
| | 2.45 | -14.27 | 53 |
| | 2.5 | -12.47 | 59 |

**Antenna Pattern Plot**

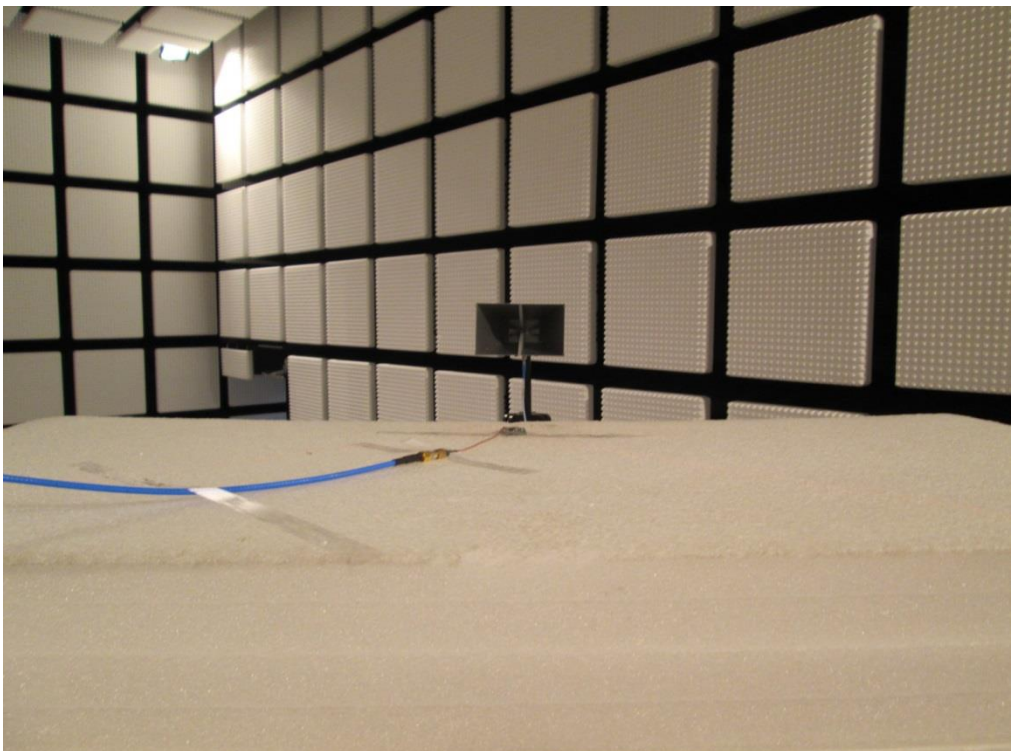
Polarization: Horizontal



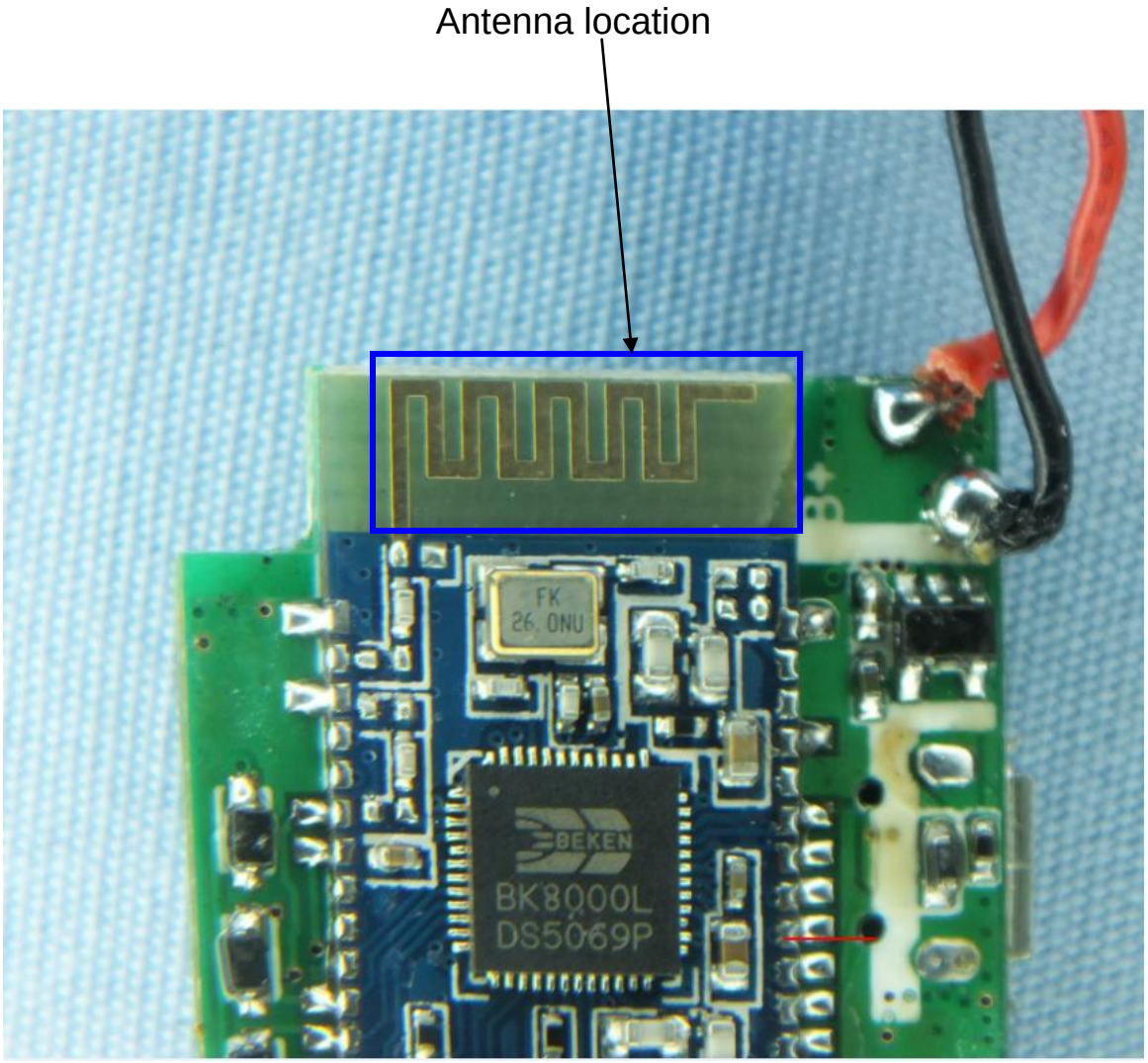

Polarization: Vertical



# 4 Photographs of the Test Configuration



# 5 Photographs of EUT



# 6 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp, it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan Hsiang. Location map can be found on our website http://www.icertifi.com.tw.

| **Linkou** | **Kwei Shan** | **Kwei Shan Site II** |
|---|---|---|
| Tel: 886-2-2601-1640 | Tel: 886-3-271-8666 | Tel: 886-3-271-8640 |
| No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C. | No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsien 333, Taiwan, R.O.C. | No. 14-1, Lane 19, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsien 333, Taiwan, R.O.C. |

If you have any suggestion, please feel free to contact us as below information

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Email: ICC_Service@icertifi.com.tw

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